

# CHAPTER 31

## Ancillary Tests

### KEY TEACHING POINTS

- The forced expiratory time is a valuable test in the evaluation of patients with chronic dyspnea. A forced expiratory time of 9 seconds or more increases probability of chronic obstructive lung disease; a time less than 3 seconds decreases probability of obstructive disease.
- Forced expiratory time is not prolonged in restrictive lung disease.
- A positive Snider test (inability to extinguish a burning match) increases the probability of reduced forced expiratory volume in 1 second, either from obstructive or restrictive lung disease.

### I. FORCED EXPIRATORY TIME

#### A. TECHNIQUE

To measure the forced expiratory time, the clinician places the stethoscope bell over the trachea of the patient in the suprasternal notch and asks the patient to take a deep breath and blow it all out as fast as possible.<sup>1</sup> Using a stopwatch, the duration of the audible expiratory sound is determined to the nearest half second.

Rosenblatt introduced this test in 1962 as a test of obstructive lung disease.<sup>2</sup>

#### B. PATHOGENESIS

The forced expiratory time should be prolonged in obstructive disease simply because, by definition, the ratio of FEV1 to FVC (i.e., forced expiratory volume in 1 second divided by forced vital capacity) is reduced in this disorder. Slower flow rates prolong expiratory times.

#### C. CLINICAL SIGNIFICANCE

**EBM Box 31.1** summarizes the accuracy of this finding, showing that a forced expiratory time of 9 seconds or more increases the probability of obstructive disease (likelihood ratio [LR] = 4.1) and a time less than 3 seconds decreases probability (LR = 0.2).

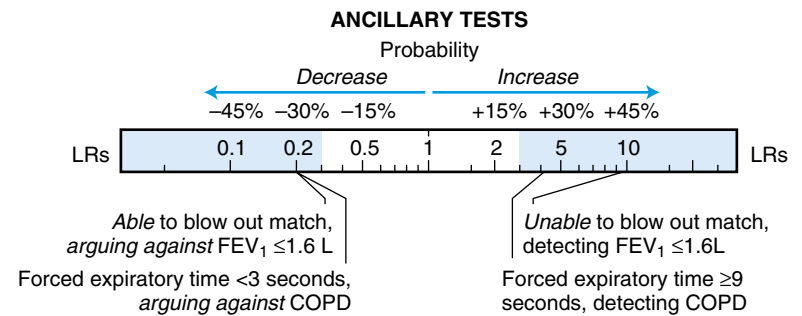
The forced expiratory time is a specific test for obstruction. Patients with restrictive lung disease, despite having reductions in the FEV1 similar to those seen in obstructive lung disease, usually have forced expiratory times of 4 seconds or less.<sup>1,2</sup>



**EBM BOX 31.1**  
*Ancillary Tests*

Finding (Reference)*	Sensitivity (%)	Specificity (%)	Likelihood Ratio <sup>†</sup> if Finding Is	
			Present	Absent
<b>Forced Expiratory Time</b>				
<b>Detecting Chronic Airflow Obstruction<sup>1,3,4</sup></b>				
<3 s	8-10	26-62	0.2	—
3-9 s	42-54	—	NS	—
≥9 s	29-50	86-98	4.1	—
<b>Unable to Blow Out the Match (Snider Test)</b>				
Detecting FEV1 of ≤1.6L <sup>5,6</sup>	62-90	91-93	9.6	0.2

\*Diagnostic standard: For chronic airflow obstruction, FEV1/FVC <0.7.  
†Likelihood ratio (LR) if finding present = positive LR; LR if finding absent = negative LR.  
NS, Not significant.  
[Click here to access calculator](#)



**II. BLOW-OUT-THE-MATCH TEST**

**A. TECHNIQUE**

The clinician lights a match and holds it 10 to 15 cm in front of the seated patient, who then attempts to extinguish it by blowing as forcibly as possible. It is important that the patient hold the mouth open and not purse the lips. Inability to extinguish the burning match is the positive finding.

The match test was introduced by Snider in 1959, who reasoned that the ability to extinguish a match was related to the velocity of exhaled air.<sup>5</sup> The test is now often called the Snider test.

**B. CLINICAL SIGNIFICANCE**

EBM Box 31.1 indicates that a positive Snider test (i.e., inability to extinguish the match) greatly increases the probability that the patient's FEV1 is at least moderately reduced to 1.6 L or less (LR = 9.6). Being able to extinguish the match argues

against an FEV1 this low (LR = 0.2). Unlike the forced expiratory time, the Snider test is abnormal in both obstructive and restrictive lung disease, which probably explains why the Snider test performs less well in studies using it as a specific sign of obstructive disease.<sup>7</sup>

*The references for this chapter can be found on [www.expertconsult.com](http://www.expertconsult.com).*

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## REFERENCES

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